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A Test of Raccoon Skins for Suede Leather*

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Since World War II, there has been such a poor market for "long-haired" furs that many trappers have given up trapping altogether. Receiving houses for raw furs are overstocked with raccoon, opossum, skunk, fox, and coyote furs. These are still the "unwanted" furs, according to the trade designation. Because of this lack of demand for these furs, numerous attempts were made to find other uses for the skins. The idea that the lower grades of "long-haired" pelts might be tanned into some type of leather and sold at a profit, seemed logical. The Fish and Wildlife Service, Department of the Interior, was especially interested in an outlet for surplus raccoon skins because the trapping of these animals on the National Wildlife Refuges is necessary to keep them under control and thereby prevent excess depredation on waterfowl and upland game birds. The Bureau of Agricultural and Industrial Chemistry, Department of Agriculture, was interested in increasing the potential supply of leather, so a cooperative experiment was planned to determine the value of raccoon skins for suede leather.

The following general procedure was used for the test: (a) select approximately 500 average skins from animals trapped in the southern part of the United States, in a region where the quality of fur skins is normally low; (b) tan the skins into a suitable type of leather; (c) determine the cost of tanning; (d) market the skins, if possible, in order to establish their commercial value.

Skins for the test were obtained from the National and State Wildlife Refuges in Louisiana and Arkansas. Approximately 100 skins were obtained from each of the following locations: (for brevity, the lots will be referred to hereafter by the two-letter lot designation).

Lot WR—White River National Wildlife Refuge, St. Charles, Ark. (Peter J. Van Huizen, Manager).

Lot MI—Marsh Island and Grand Cheniere Island, La. (Armand P. Daspit, Director Fur and Refuge Div., La. Dept. of Wildlife and Fisheries).

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Lot LS—Lacassine National Wildlife Refuge, Lake Arthur, La. (Charles M. Parker, Manager) and Sabine National Wildlife Refuge, Sulphur, La. (Vandiver L. Childs, Manager).

Lot MX—A mixed lot obtained from Lacassine and Sabine National Wildlife Refuges; Grand Cheniere and Marsh Island State Wildlife Refuges; and Vermilion Parish, Abbeville, La.

Lot DT—Delta National Wildlife Refuge, Pilottown, La. (Kent Meyers, Manager.)

At the Laboratory, the skins were numbered consecutively with a perforated die and weighed. The area was measured with a planimeter, and after the fur was clipped, the thickness of the skin was measured at a spot beside the backbone about 2 inches in front of the tail.

The skins were plumped with alum and G942 (a DuPont product)*, and then were chrome-tanned at a commercial tannery into black, suede, shoe upper leather. Suede leather, which is finished on the flesh side, seemed to be the best tannage for these skins because the grain or hair side of many skins was damaged by sores, scratches, scars, or similar faults, and they could have been finished on the grain, if at all, only after heavy buffing.

The tanned skins were graded at the tannery into three grades—C, D, and R (rejects). Later they were graded again by another sorter, with much the same results. Table I shows the grading data. Nearly one-third of the skins were classified as rejects, and a little more than one-half were just acceptable (Grade D). Relatively few of the skins had a good nap, i. e., a dense, even nap that did not show “bare” spots when the leather was stretched.

*In mentioning trade name in this publication, the Bureau of Agricultural and Industrial Chemistry, United States Department of Agriculture, does not in any way guarantee this product nor is it recommended in preference to others not mentioned.

TABLE I
Grade of Raccoon Leather

Grader	Source of skins	Proportion of skins in grade*		
		C	D	R
I	WR	10	63	27
	MI, LS, MX	6	73	21
	DT	0	37	63
	Average	6	63	31
II	WR	17	44	39
	MI, LS, MX	25	53	22
	DT	0	42	58
	Average	19	49	32

* C, fair; D, poor; R, reject.

Table II gives data on weight, area, and thickness for both the raw and tanned skins. The weight of the leather, based on the weight of the skins as received at the Laboratory, had the extremely low value of 17.8 per cent. There are several reasons for this great loss in weight. As a rule, the skins were greasy, and some had heavy deposits of fat on the flesh side; the hair comprised about 20 per cent of the weight of the raw skin, and in addition the hair of some pelts contained considerable dirt; and trimming out leather with tack or lacing holes and removing ears, snout, and claws caused appreciable loss in weight.

TABLE II
Weight, Area and Thickness of Raccoon Skins
and of Suede Leather Made From Them

Source of skins	Number of skins	Raw skins		Tanned skins	Yield
		Range	Average	Average	Tanned/raw,
		WEIGHT — ounces			
WR	82	4.8 – 19.7	11.6	1.61	13.9
MI	92	2.5 – 18.4	8.4	1.49	17.7
LS	89	3.2 – 19.6	9.5	1.92	20.2
MX	97	3.4 – 18.4	9.0	1.76	19.6
DT	76	6.9 – 20.1	10.5	1.86	17.7
Average*	436	2.5 – 20.1	9.7	1.73	17.8
AREA – square feet**					
WR		1.25 – 2.80	2.07	1.12	53.8
MI		.95 – 3.55	1.89	1.06	56.1
LS		1.20 – 3.10	2.11	1.26	59.7
MX		1.10 – 3.55	2.00	1.16	57.9
DT		1.45 – 3.15	2.16	1.38	64.0
Average*		.95 – 3.55	2.04	1.19	58.3
THICKNESS – mils					
WR		21.6 – 93.7	53.9	29.4	54.5
MI		10.6 – 72.8	30.2	28.5	94.4
LS		12.6 – 68.9	30.1	30.5	101.1
MX		11.8 – 98.4	32.2	30.2	93.8
DT		17.7 – 74.8	36.8	29.1	79.1
Average*		10.6 – 98.4	34.5	29.6	85.7

* Averages except total for "Number of skins" and *Maximum spread* for "Range".

** Area of raw skins was measured through the tack or lacing holes because it would be necessary to trim the skins inside this line during tanning. The recorded areas are, therefore, less than those of the original skins, and the area yields are slightly high.

The loss in area (42 per cent) was less than the loss in weight (82 per cent)* nevertheless, the decrease in area from an average of 2 square feet per skin in the raw state to hardly more than 1 square foot after tanning was a serious loss. Since such leather is sold by the square foot, the possible selling value was only a little more than half of what it would have been if there had been no shrinkage. In the second place, the reduction in size made economical cutting impossible. The thickness of a skin varies from backbone to flanks and from head to tail, so that it is difficult to cut pieces of reasonable uniformity from such small skins. Plumping during tanning was at least partly responsible for the decrease in area, yet it was not effective in developing a satisfactory nap.

In general, the loss in weight, area, and thickness during tanning, together with the poor nap, made use of the skins for shoe leather impractical. Another type of leather might have given somewhat different results; however, no other type seemed to offer more promise of successful use. One of the first uses suggested was for glove leather, but a glove manufacturer stated that he could not use such small skins because the costs would be prohibitive. The skins seemed to have no unusual qualities that would make them particularly suitable for some special type of leather.

The physical and chemical properties of 16 tanned skins, selected as representative of the trapping areas and of the skins in size and quality, were determined. The results are given in Tables III and IV. Tensile strength (Table III) was satisfactory for this type of leather. The data indicate that as quality decreased there were an increase in area yield, and decreases in weight yield, tensile strength in the direction parallel to the backbone and in stretch in the perpendicular direction. The data, however, are too meagre for definite conclusions.

The chemical analyses (Table IV) do not reveal any differences that may be ascribed to source of skins or quality of leather. In fact, the composition is not unusual and is uniform between skins.

A number of shoe firms and wholesalers were approached regarding purchase of the leather. None were interested. The pieces were small and, therefore, would be expensive to cut into shoe parts; also the nap was poor, so that the leather would be suitable only for low-quality shoes. If nap quality had been excellent, the skins could have been used in spite of their small size. On the other hand, if they had averaged 4 or 5 square feet in area they could have been used even though the nap was poor. Sale of a small lot of leather—only about 500 square feet—would be difficult, however, under any circumstances.

An estimate of the value of the raccoon leather, at a season when suede was not in demand, was 10 cents per square foot. Later, when the demand

*Part of the difference between area shrinkage and weight shrinkage is due to the fact that the trimmed area, rather than the full area, of the raw skins was measured. See footnote 2, Table II.

TABLE III
Physical Properties of Raccoon Leathers

Skin No.	Source of skins	Leather grade	Weight yield %	Area yield %	Density oz./cu. in.	Tensile Strength lb./in.2*	Tensile Strength lb./in.2**	Stretch %*	Stretch %**
1	WR	C	18	58	0.38	5,730	3,060	32	102
2	WR	D	13	47	.35	4,890	3,160	32	84
3	WR	R	15	57	.36	5,360	3,230	32	86
4	WR	R	13	60	.35	4,420	2,460	26	75
5	MI	C	14	42	.36	6,200	3,200	28	78
6	MI	D	20	49	.35	4,990	2,620	30	106
7	MI	R	13	62	.33	4,120	3,160	32	65
8	LS	C	23	52	.36	6,000	3,680	30	82
9	LS	D	19	44	.34	5,480	2,990	29	81
10	LS	D	24	60	.33	5,490	2,860	28	87
11	LS	R	16	64	.34	5,760	3,460	32	72
12	MX	C	20	46	.32	5,390	2,730	30	78
13	DT	D	17	54	.33	4,940	2,360	28	62
14	DT	D	17	59	.34	4,940	2,720	22	74
15	DT	R	15	60	.34	4,860	2,530	35	76
16	DT	R	21	60	.32	4,040	2,090	24	58
Average			17	55	.34	5,163	2,894	29	79

* Parallel to backbone.

** Perpendicular to backbone.

TABLE IV
Chemical Analyses of Raccoon Leathers

Skin No.	Source of skins	Hide substance N x 5.62	Fat (petroleum ether extract)	Ash	Chromic oxide (Cr ₂ O ₃)
		%	%	%	%
1, 2	WR	76.5	5.9	3.6	2.8
3, 4	WR	74.1	6.5	3.7	2.7
5, 6, 7	MI	74.7	6.1	3.7	2.7
8, 9	LS	75.2	5.6	3.7	2.7
10, 11	LS	76.5	5.1	3.8	2.8
13, 14	DT	76.1	5.7	3.7	2.7
15, 16	DT	75.3	5.3	4.0	2.8
Average		75.5	5.7	3.7	2.7

for suede was good, an estimated value of 15-18 cents per square foot was placed on it but even 18 cents would not quite cover the cost of tanning. It does not appear that the leather would sell for enough to pay for tanning it, under any circumstances.

If use of the skin for leather had proved feasible, the fur would have been a by-product. Hair or fur removed by the usual tannery wet process has relatively little value, being suitable only for use in insulation or padding. A possible, more important use appeared to be for making felt. A hat manufacturer examined a few samples and found the fur satisfactory for hat felt. He estimated it would be worth approximately 1 dollar a pound.

For felt, the fur must be clipped, because that removed by a depilant does not felt satisfactorily. In the present method of clipping fur for felt, the skin is reduced to shreds which have no value for making leather. A machine has been designed to clip whole skins, but it damages the skins so that they cannot be used for leather. Nineteen machine-clipped skins yielded 17.1 ounces of fur. As the fur would be worth less than 6 cents per skin, it would not pay the cost of trapping the animals. An average of 2 ounces of fur per skin was obtained with small, hand-operated, electric clippers, but the operation was too slow for commercial use. Salvage of the fur, either with or without use of the skin, does not appear economically feasible under present conditions.

SUMMARY

Long-haired furs have not been in demand since World War II, and a large surplus has accumulated. To determine the possibility of using such skins for leather, 500 raccoon skins were tanned commercially to suede, shoe upper leather. The tanned skins were small and the quality of the leather was poor. A typical comment of a shoe manufacturer was the following: "The leather appears to have sufficient strength and weight for shoe purposes but would be extremely costly to cut because of the small size of the skins. The nap is not comparable to good suede, being sparse and having a tendency to open up, which we believe would not make a very attractive shoe."

Raccoon skins could not be tanned profitably to suede leather, and tanning to other types of leather does not appear any more promising. Salvaging the fur for felt would yield little profit, if any.